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Prof. Dr. Christian Calliess, LL.M. Eur
Freie Universität Berlin

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Christian Calliess:

Towards a European Innovation Principle Endorsed by Better Regulation

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Prof. Dr. Christian Calliess, Berlin

Towards a European Innovation Principle Endorsed by Better Regulation[1]

I. Introduction

Innovation is an essential element of sustainable growth. While the internal market is defined by the objective of a "highly competitive social market economy, aiming at full employment and social progress, and a high level of protection and improvement of the quality of the environment" (Article 3 (3) TEU) innovation becomes a precondition of a sustainable and green economy. It leads to higher productivity and competitiveness[2] while also bringing social and environmental benefits. By definition, innovation cannot be preordained. It takes place in response to diverse incentives. The policymaker's task is not to pick winners but to ensure that the entire economy becomes better-suited for innovative outcomes. Regulation matters at all stages of the innovation cycle, from research and development, to diffusion, commercialisation and beyond. Therefore, a toolbox of innovation-enabling legislation can help to unleash the innovative potential of European companies and individuals.

II. Innovation: Elements of a definition

Innovation can be defined by two elements:

The first element refers essentially to the aspect of novelty: Innovation is a new idea on something that is established. This idea must have found its way from theory to practice. As such innovation does not only relate to technical or scientific novelties, but may as well come up in the field of marketing, the management of processes or the organization of or within an industry.

The second element of a definition contains a teleological criterion: A technical novelty or a new approach can only be regarded as innovative if it brings economic and societal benefits. Therefore each innovation has to become accepted, it has to convince society. Against this backdrop an innovation is to be understood as well as a process, in which the novelty has to win recognition against the established.

III. Innovation as a political and legal principle

[1] *Christian Calliess* is Professor for Public and European Law at Free University of Berlin. From 2015 till 2018 he was on leave from his professorship and Legal Adviser to the European Political Strategy Center (EPSC), the In-House-Think-Tank advising the President of the European Commission, Jean Claude Juncker. There he was as well Head of the Institutional Team. This contribution is a slightly different version of a paper with the same title written by the author and published as EPSC Strategic Note Issue 14, 30 June 2016.

[2] Oslo Manual, The Measurement of Scientific and Technological Activities http://www.oecd-ilibrary.org/docserver/download/9205111e.pdf?expires=1463069556&id=id&accname=guest&checksum=C3B78BD44AE23B05FECE2099F936A087

Without doubt, the decision to foster innovation in the decision making process of the EU is a political choice. An innovation principle is then about the political decision ensuring that whenever policy is being made, the impact on innovation is fully assessed. In this regard Union law may provide for the promotion of innovation. But notwithstanding this, one may even think of a Treaty based "innovation principle" that provides legal guidance to ensure the right choice and appropriate application of regulatory tools.

Several aspects in Union Law allow for the assumption that an implicit innovation principle can be deduced from the Treaties by systemic and teleological interpretation:

According to **Article 3 (3) TEU** the EU *"shall promote scientific and technological advance."* In the context of the EUs industry policy **(Art. 173 TFEU)** "innovation" is explicitly mentioned. For that purpose, in accordance with a system of open and competitive markets, the action of the EU and its Member States shall be aimed among others at "*fostering better exploitation of the industrial potential of policies of **innovation**, research and technological development*". In this respect as well **Art. 179 (1) TFEU** is of interest. It sets the task of achieving a European research area by strengthening the scientific and technological bases. This shall encourage the Union, including its industry, to become more competitive.

Notwithstanding this even more important for deducing an implicit innovation principle are the guarantees embodied in the **EU Charter of Fundamental Rights**. While stipulating the freedom of sciences **(Art. 13)**, the freedom to choose an occupation and the right to engage in work **(Art. 15)** and the right to property including intellectual property **(Art. 17)** the Charta defines important (pre-) conditions for innovation. As innovation largely arises from freely exercised economic and scientific activities, these individual rights spur experimentation and the development of new concepts and ideas.

Two ways can be identified on **how fundamental rights put innovation into practise**:

Under the rule of law (Art. 2 TEU) fundamental rights imply a duty to respect freedom for state authorities. In their **subjective dimension** they serve as a benchmark for the assessment of all public action interfering with individual freedom. Any action taken by state authorities is considered as an intervention in individual freedom and, as such, faces the pressure of legitimation. Hence (in theory) a kind of **rule and exception logic** is embodied in each fundamental right, that is defined by the citizen's freedom on the one hand and the public authorities' corresponding competence to limit its scope for the sake of the protection of public goods on the other. As a consequence any measure taken by state authorities constitutes an interference with individual freedom, which must then be legitimated from a formal perspective by statutory law and from a substantive perspective with regard to the citizen's constitutional rights.[3]

How fundamental rights work: The rule and exception logic

If state authorities want to interfere in the scope of protection of a fundamental right, they are obliged to legitimize their action, whereas the beneficiary of that right does not need to justify his acts or omissions, as long as he acts within the limits of his right. As a consequence the

[3] For a more thorough analysis see: Calliess, Dimensions of Fundamental Rights – Duty to Respect versus Duty to Protect, in: Hermann Pünder/Christian Waldhoff (Hrsg.), Debates in German Public Law, Oxford und Portland 2014, S. 27.

burden of proof *lies with state authorities wishing to regulate, they must prove their 'better right' to regulate.*

Notwithstanding this the exercise of fundamental rights is subject to limitations provided for by legislation (Art. 52 Charter of Fundamental Rights). Therefore the concrete scope of protection results from the interplay between the good protected by the relevant fundamental right and the limiting statute (EU regulations, directives), which finds its concrete shape in the test of proportionality. With the objective to reach a fair balance, action of public authorities has to pass a three-level test: first, public action needs to be suitable for reaching the intended aim. Secondly, it has to prove to be necessary, in order to reach the intended aim. This means that no other available measure can reach the intended aim in a similarly effective but less freedom-limiting way. Thirdly, public action has to be appropriate. To that end, a fair balance between the intended aim and the protected interest enshrined in the fundamental right in question has to be proven by state authorities.

Apart from this subjective dimension fundamental rights may have as well an **objective dimension**, giving them the **effect of a principle**. In this regard they imply a legal duty to optimize the objective of the relevant individual right, while at the same time taking into account opposing principles and individual rights. As a principle, the above mentioned fundamental rights set out the positive obligation to facilitate the exercise of these rights, when designing policies and making laws. This can be achieved for example through the creation of an innovation enabling legal framework, infrastructure or the funding of promising ideas.

On these legal grounds, based on the interpretation of different norms, one may say that an **implicit Treaty based innovation principle sets guidelines** for optimizing the legal framework for innovation.

IV. Keeping a fair balance: The complex relationship between innovation and regulation

Optimizing the legal framework for innovation implies at the same time, that a **fair balance** between the innovation principle and other Treaty based principles is achieved. In this framework public authorities decide on "good" and "bad" innovation.

Art. 3 (3) TEU states the objective of establishing an internal market. In this regard an important tool of the EU is the harmonization of national legislation (Art. 114 TFEU). However, the creation of the internal market is inseparably linked with the duty to adequately protect the environment, consumer´s rights and health. The EU has to address all these objectives. Art. 3 (3) TEU does not permit to focus one-sidedly on economic benefits and higher growth. Legal and regulatory requirements have to aim at optimizing outcomes in all policy fields and demand for a high level of environmental, health and consumer protection (Art. 114 (2) TFEU). This aspect is highlighted by the key provisions of the TFEU regarding environmental, health and consumer protection.

Treaty based principles to be balanced with the innovation principle

Art. 11 TFEU *states that environmental protection requirements must be integrated into the definition and implementation of the Union´s policies and activities, in particular with a view to promoting sustainable development. This provision requires the integration of environmental protection measures also in policy fields that are traditionally not considered part of the environmental policy. This is sometimes referred to as the „integration principle".*

Art. 191 TFEU *sets another important principle of European environmental law, which is of high relevance regarding innovation: the precautionary principle. Art. 191 Para. 2 TFEU as well as Art. 114 TFEU provide that the environmental policy of the EU shall aim at a high level of protection and should be based on the* ***precautionary principle****. The precautionary principle basically is about the management of risk. It applies notably where scientific evidence is inconclusive or is contested between experts but a preliminary and objective scientific risk assessment raises justified concern that a substance, production process or product may cause harm to human health or the environment. Although the precautionary principle derives from environmental law, it is – according to the jurisdiction of the ECJ – a general principle of EU law, that includes economic and non-economic considerations. It provides therefore suitable tools and strategies to appropriately cope with risk.*

Although the precautionary principle may be understood as a counter principle to the innovation principle, it is of particular importance for innovation, because especially at an early stage of a new technique or approach, the possibility of a risk often cannot be ruled out. It provides procedures and criteria to assess, appraise and manage risks. An integral part of the risk management as envisaged by the precautionary principle is the examination of the potential benefits and costs of action, or lack of action.

According to ***Art. 168 TFEU*** *every regulatory decision has to consider its impact on human health, while maintaining a high level of protection.*

Art. 12 TFEU *affirms that consumer protection requirements shall be taken into account in defining and implementing other Union policies and activities.* ***Art. 169 TFEU*** *provides that the promotion of consumer´s interests and a high level of consumer protection are an objective of the European Union.*

The significance of these objectives, as well as their legally binding character is confirmed by the ***Charter of Fundamental Rights of the European Union****. The second sentence of* ***Art. 35 CFR*** *provides a high level of human health protection;* ***Art. 37 CFR*** *addresses the duties of authorities to protect the environment; and* ***Art. 38 CFR*** *requires a high level of consumer protection.*

Against this backdrop it would be a **misunderstanding to interpret the innovation principle as a counter-principle to the precautionary principle**. The innovation principle is to be conceived in a **comprehensive manner**. It should aim at improving the overall societal well-being by enhancing the effectiveness, coherence and comprehensibility of regulation. However, if the innovation agenda focuses exclusively on competitiveness, that is, on reducing costs to industry, without considering social and environmental costs, **it risks yielding *less* regulation instead of *better* results**. Therefore one has to draw a distinction between innovation affecting aspects of environmental, consumer and health protection and issues rather technical in nature.

The former leave less room for flexibility, whereas the scope for the innovation principle is wider in rather technical matters.

As regulatory burdens are often perceived as a major obstacle to innovation, the objective of improving the legal framework is shared by both, the innovation principle and **Better Regulation policy**. Therefore between both exists a close link, that has to be taken into account, while implementing the innovation principle. The relationship between regulation and innovation is neither straightforward nor unidirectional: **regulation can simultaneously constrain and drive innovation**, whilst a lack of regulation may lead to **uncertainty**.

1. Regulation as a barrier to innovation

On the one hand, regulation can become a barrier to innovation. The most obvious reason is that **ineffective and incomprehensive regulation** can create "red tape" that requires huge administrative efforts for business – incidentally, for administrative authorities as well. In this case regulation deprives entrepreneurs of resources and time that they could have used for more productive activities instead.

Furthermore, if regulation is **too rigid and inflexible** it may have negative impacts on innovation. Inflexible regulation can cause unnecessary financial burdens if it provides little scope for business to decide on *how* it can comply with a legal requirement in the least burdensome way. A good example for this may be the introduction of LED street lighting. The EU legislation for street lighting was based upon traditional technology, from which LED lighting technology diverted. It took more than two years to make the necessary legislative improvements to allow for the commercial introduction of this energy efficient alternative.

Prescriptive regulations, such as technology standards, **stipulate not only the target but also ways of meeting the target**. Whilst these have the benefit of facilitating the enforcement of a regulation, they may not generate sufficient incentives for firms to seek to improve their product or service beyond the target, stifling innovation, particularly in its disruptive form.

Regulation also acts as a barrier to innovation when it 'lags behind' innovation cycles. Driverless cars are set to transform mobility and transportation in the future. The technology development in the area of vehicle automation is ripe. There is now a need to demonstrate technological readiness, reliability and safety. However the demonstration phase is currently held back by existing legislation on vehicle safety approval. For instance, the relevant United Nations Regulation[4] permits automated steering functions in cars only up to a speed of 10 km/h. A draft amendment to increase driving speed is currently under discussion but this regulatory lag constrains the development of large-scale pilots in the EU.

Finally **complex and expansive market approval procedures** may constitute a costly burden for newcomers, especially as innovative ideas are often developed in niche companies with limited financial resources. In the worst case, an innovative idea might be obstructed by rigid regulation.

[4] United Nations Regulation on 'Uniform Provisions Concerning the Approval of Vehicles with regard to Steering Equipment'

2. Regulation as a driver of innovation

On the other hand, regulation is also a major driver of innovation – an aspect which is not always highlighted in the public discourse. For example, the general framework for finance and funding conditions, bankruptcy legislation or intellectual property rights set an important pre-condition for innovation.

In general terms regulation is an important aspect of investment and planning **stability and certainty** for companies. The rule of law supported by fundamental rights provides for a stable framework for investment and by this for innovation. A complex set of different rules ensures that companies find a stable framework, in which they can pursue their business. From the authorization of the production plant, that protects investment not only with regard to public goods but as well with regard to environmental demands of its neighbors, to the regulation on products, that protects an innovative product not only under the aspect of intellectual property but as well against private claims in case the product causes damage to individuals or the environment, most companies appreciate this investment stability by regulation.

But regulation ensures not only compliance with the market and public goods, but as well might push for innovation. This should be illustrated by the following examples.

Standard setting may yield positive impacts by providing orientation both for the producer as for the costumer. For the producer of a new product, standards can give guidance in how to design it. For the costumer side, the information that an innovation meets the standards can make the yet unknown product more trustworthy. Standards allow for comparison and may therefore improve the market functioning.

Stringency of regulation can be as well an important driver for modernizing business and thus for innovation by fostering research in and use of modern techniques and procedures, respectively to end the use of outdated techniques.

Examples of regulation stimulating innovation

*An example is the regulation intended to shift to a resource-efficient, low-carbon economy. As the Commission has stated in its **Europe 2020 strategy**, "continuing our current patterns of resource use is not an option". For this reason, increasing resource efficiency will be a key to securing growth and competitiveness of Europe. It is therefore necessary to stimulate innovation that yields resource-efficient technologies and approaches and helps optimising production processes.*

An evaluation carried out for the Commission on the car and van CO_2 Regulations[5] showed clearly increasing rates of deployment of sophisticated CO_2 reducing technologies, patenting rates, and R&D expenditure. Furthermore, the eco-innovation aspect of the Regulations by its nature incites innovation by component suppliers and manufacturers. The evaluation concludes that: "there is sufficient evidence supporting the view that the introduction of the Regulations has had a positive impact on innovation through encouraging higher R&D, development of technologies and deployment of fuel efficient technologies in the market."

*The Recommendation on **Radio Frequency Identification (RFID) chips** from 2009 lead in 2014 to the adoption of EU-wide norms. Compared to the old bar code technology, RFID allows*

[5] http://ec.europa.eu/clima/policies/transport/vehicles/docs/evaluation_ldv_co2_regs_en.pdf

for continuous and more accurate information as well as more data storage. By standardizing the rules for RFID applications the EU enables innovation for a wide range of purposes such as personal identification or access control (e.g. secure access in stadiums), for shopping (e.g. tagging of groceries), for inventory tracking and tracing (e.g. tracking luggage), and for payment (e.g. motorway tolls).[6]

In June 2016 the European Commission adopted the Communication ***"A European agenda for the collaborative economy"****.*[7] *It provides important guidelines for innovative business models in the new economy. These refer to market access, liability, consumer protection, labour law and tax liability. The Communication invites EU Member States to review and where appropriate revise existing legislation with the aim to harmonize the collaborative economy services offered to the market so that EU citizens can enjoy the services in similar way despite the fact of living in Sweden or Malta.*

One of the best ***examples of regulatory decisions*** *that allowed Europe to lead the first stage of the Information Technology revolution is the* ***Global System for Mobile Communications, or the GSM****, endorsed by the Heads of State or Government in 1986. The adoption of a unified, open standard at the European level allowed for the rapid roll-out of mobile telecommunication and gave Europe an edge over more fragmented markets, including that of the United States. The first GSM call in the world was made by the former Finnish Prime Minister Harri Holkeri to the mayor of Tampere Kaarina Suonio on 1 July 1991.*

Stability and certainty are pre-requisites for innovation. Therefore data will play a fundamental role in the upcoming years, but European companies are struggling to understand how to deal with respecting customers' personal data while taking advantages of this resource. 28 different national legislations on data protection, the ECJ Safe Harbour Decision invalidating the EU-US agreement on collection and access to European citizens' data[8] *as well as the difficulties in the adoption of the new EU-US Privacy Shield agreement lead to legal uncertainty, that is a barrier to innovation. Against this backdrop the* ***General Data Protection Regulation (GDPR)****, that will become compulsory at the first half of 2018 might enable innovative business models by creating a single set of rules applicable in all Member States.*

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3. Lack of regulation as a challenge to innovation

In some cases, innovative developments occur in **under-regulated areas** or in regulatory vacuums. Uncertainty on the conditions of market access as well as on questions of liability is then perceived as a barrier to innovation. Business model innovations such as Uber or AirBnb have disrupted traditional sectors. They have not only offered products and services which often better reflect modern preferences but at the same time, they have also been a mixed blessing, producing adverse side-effects such as the rise of the value of real estate in some cities in the case of AirBnb.

[6] European Commission, DG CONNECT Internal Report, on the implementation of the Commission Recommendation on the implementation of privacy and data protection principles in applications supported by radio-frequency identification, 2014.
[7] European Commission, COM(2016) 356 final, 2016.
[8] European Court of Justice, Case C-362/14, Maximillian Schrems v. Data Protection Commissioner.

IV. Making the Innovation Principle work

To reap the benefits of the innovation principle, there is a need to develop a differentiated approach. It is necessary to account for the different categories of regulation and ensure that synergies between policy areas are created. **General regulation**, for example, affects innovative activities by providing the overall framework for business and research activities. It is applicable across sectors and encompasses primarily competition or procurement rules, and bankruptcy legislation. General regulation affects in particular the balance of expected risks and benefits associated with entrepreneurial efforts. **Innovation-specific rules**, on the other hand, aim at incentivising innovation, often by reducing the cost of innovative activities. Examples of this kind of regulation include funding rules or the regulation of technology transfer agreements. Finally, **sector-specific regulation** matters because different sectors have different capabilities and incentives to innovate. Growing environmental and social concerns raise specific challenges and opportunities for policy, in particular by creating the right incentives to support circular economy objectives in the innovation process.

Importantly, 'EU regulation matters at all stages of the innovation process'[9]. In the **research and development phase,** it is essential to generate space for the pursuit of a variety of creative options. Rules on cooperation of universities or other research facilities with entrepreneurs, funding provisions, tax credits on research and development activities or pre-commercial procurement are all relevant to ensure the sharing of risks and benefits of research and development efforts between society and private entrepreneurs. Finding the right balance that encourages the openness of knowledge and ideas while simultaneously protecting the returns on investment of individual economic actors is hugely significant during the early stages of innovation.

During the **commercialisation phase,** a product or service is offered on the market and a partly different set of rules is at stake. It involves health, consumer and environmental protection standards as well as competition rules and sector-specific procedures for launching new products, such as authorisation requirements.

The **recycling phase** of the innovation cycle is a cornerstone of the shift towards a more resource-efficient economic model. Guaranteeing the right incentives to develop life-cycle approaches to innovation should be the primary objective of regulation, particularly by fostering 'circular-by-design' eco-products. Eco-design regulation may be an additional requirement for the producer of a product for the first use, but also facilitates innovative re-use approaches. Procurement rules, taxation of resource use, and funding of research and development in the field of circular economy are further instruments to spur innovation.

[9] CEPS Special Report, November 2014
https://www.ceps.eu/system/files/No%2096%20EU%20Legislation%20and%20Innovation.pdf

Three aspects that define the impact of regulation on innovation:

Information*: Information and data play a crucial role for market participants. Transparent and equal access to data is an important function and target of regulation. Regulatory standards or measurement requirements provide important information for entities that develop innovative products or services.*

Flexibility*: Flexibility describes the number of implementation paths companies have at their disposal for compliance. Flexible regulation provides outcome-oriented targets and empowers the concerned companies to decide about how they meet the target. It allows new methods and techniques to develop with the aim of compliance.*

Stringency*: A legal requirement can be regarded as stringent, if it imposes strong obligations for firms or an industry. Legal stringency can indeed be a burden for companies and reduce their capacity for innovative activities. However stringent standards may at the same time set challenging targets and hence spur innovation. They can initially increase compliance costs of an industry, but induce modernisation in the longer term.*

1. Exploring a Full-Range of Instruments and Tools

The innovation principle, understood as a positive obligation to facilitate innovation, **offers guidance on the process and content of regulation**. It is premised on the idea that well-designed regulation ensures the appropriate framework conditions to foster entrepreneurship and a culture of innovation. Applying the innovation principle can be done both with reference to the process as well as through its content. Both are of equal importance to achieve a qualitative change in the way that regulation can fuel innovation.

2. Process-Related Innovation Principle: Better Regulation Agenda

In light of the perceived and actual regulatory burdens that constrain innovation in the EU, the **Better Regulation Agenda**, which aims to improve the EU's legal framework conditions, **represents an essential first step in assessing and tackling ways in which regulation, or lack thereof, may be constraining innovation**. The legal framework for the Better Regulation Agenda derives from the principles of subsidiarity and proportionality, as laid down in Art. 5 (3) and (4) TEU. The principle of subsidiarity governs the Union´s non-exclusive competences by providing that the Union may exercise its non-exclusive powers if (1) the Member States cannot sufficiently achieve the proposed action, and (2) the action can be implemented more successfully by the Union. In this respect the principle of subsidiarity aims at restricting ineffective, unnecessary and therefore burdensome regulation at Union level. In addition, the proportionality principle requires that Union action shall not go beyond what is strictly necessary to achieve a given objective. By imposing the choice of the least disruptive instrument, **the principle of proportionality protects innovative activities against excessive and abundant regulation**. Importantly from the point of view of the innovation principle, it speaks in favour of the prior consideration of private action as well as the involvement of stakeholders.

However, Better Regulation with regard to the objectives and principles of the Treaties cannot be an end in itself. It offers the tools to pursue public interest insofar as it seeks to balance growth and employment targets with other broader 'public good' priorities, such as the protection of human and environmental health.

An innovation-friendly regulatory framework

In order to support innovation, the Better Regulation Agenda should aim to :

- *further improve the design of existing and future regulations as regards their impact on innovation*
- *achieve an optimal balance between predictability of the regulatory environment and adaptability to technological and scientific progress*
- *ensure an overall approach to the assessment of the combined impact of regulations, with a view of simplifying and increasing the effectiveness of the regulatory framework*
- *check implementation issues that can affect outcomes and increase dialogue with stakeholders*
- *search for future-proof, more forward-looking and innovation friendly approaches*

In this regard, different tools can be identified. First of all, there is the **Impact Assessment in the legislative process**, which is now mandatory for Commission initiatives that are likely to have significant economic, environmental or social consequences. Among the types of impact that have to be identified, and if they prove to be significant, assessed, there is the impact on innovation. Constraints on the practice of the Impact Assessment often have to do with insufficient data which is available, limited ability to quantify results or limited comparability of different options. An innovation principle calls for a systematic scrutiny of the impact of regulatory proposals on innovative activities. Another benefit of Impact Assessment is its comprehensive approach, which requires the consideration of impacts on environmental, health and consumer protection. This implies that environmental and social costs are adequately assessed, even if they are often hard to monetize. Only under this premise Impact Assessments may optimize regulatory decisions and remove burdens for innovative activities.

To complement *ex ante* Impact Assessments of regulatory proposals, existing regulation should be subject as well to ***ex post* evaluation**. *Ex post* evaluation can provide information about effectiveness, unintended impact, costs and benefits of regulation, as well as the accuracy of the estimates during the ex-ante Impact Assessment.

In the context of emerging technologies, **experimental legislation** provides a tool to test new legal approaches.[10] Today, technological and social developments created highly dynamic environments. Notably technological progress seems to further accelerate this process. Highly innovative fields have emerged, which are characterized from the legislator´s point of view by

[10] Sofia Ranchordás, Constitutional Sunsets and Experimental Legislation, 2014, pp. 59.

lack of information, rapid changes, uncertainty and risks. Regulation needs to keep up with these changes in order to control emerging risks and at the same time safeguard the opportunities that these changes open up. Experimental regulation enables the authorities to test new regulatory approaches and evaluate the outcome. These may take the form of dispositions that are enacted on an experimental basis, in derogation of existing law. This is already the case at the Member State level with reference to self-driving vehicles. France, Finland, and the Netherlands have adopted the necessary legal framework to enable testing of automated cars on public roads in 2015, whilst Germany and Sweden have opted for the introduction of special exemption procedures. An integral part of experimental legislation or regulation is the periodic or final revision, particularly when regulators must 'keep up' with the pace of technological or information change.

3. Content-Related Innovation Principle: Synergy Between Tools

Where legislation lags behind market developments, the innovation principle approach can lead to the introduction of innovation-enabling aspects into the law.

Several tools by which the legislator can enable and foster innovation can be identified:

a) Mutual Recognition and Country-Of-Origin Principle

Amongst the tools available to legislators, **developed by the European Court of Justice to tackle barriers to the freedom of goods and services**, and hence furthering the internal market as well as stimulating competition **remain the most comprehensive means to incentivise innovation**. Notwithstanding the objectives of environmental, consumer and health protection, the concept of mutual recognition ensures that any product lawfully sold in one EU country can be sold in another, whilst the country-of-origin principle enables entities to trade in other Member States on the basis of their home country regulation. This is of particular importance with regard to online commerce and the digital single market strategy, because online trading platforms ease intra-EU transactions, both for sellers and for consumers. Both of these legal concepts are especially advantageous for small and medium-sized enterprises that do not have the capacity to obtain legal advice and to comply with foreign law.

b) Standard setting

Whilst standards can sometimes constrain innovation by locking in sub-optimal technologies, they may also contribute to innovation by: a) exploitation of the economies of scale by ensuring interoperability between products, b) reducing barriers to entry, c) certainty on market access for companies, d) pushing for research in new technologies and e) building network effects which increase scaling-up opportunities for innovation[11]. In addition, standards yield benefits to consumers and the environment, by ensuring minimum quality or safety standards. This can increase trust and acceptance of consumers, a precondition for successful market access. TESLA's 'our-patent-belongs-to-you' model[12] is an interesting example of keeping production processes open in the belief that by enabling others to copy one's model and improve on one's

[11] For a full analysis see https://www.nesta.org.uk/sites/default/files/the_impact_of_standardization_and_standards_on_innovation.pdf
[12] https://www.teslamotors.com/blog/all-our-patent-are-belong-you

ideas, the overall market supply will increase, stimulating demand for electric cars and increasing the size of the market.

c) Test of alternatives

Another approach to enhance innovation is by means of the **test of alternatives**. Unlike in the traditional administrative procedure, in which an applicant submits a clearly defined request for authorisation, **the possibility can be created for the consideration of alternative solutions**. The test of alternatives is in a way related to the principle of proportionality, because it seeks to determine the appropriate but least burdensome solution. However, the principle of proportionality contains a restriction of state actions, whereas the test of alternatives refers to the approvability of an application. The examination of alternatives has the potential to encourage innovation and search for new approaches to existing goals.

A test of alternatives is envisaged in the environmental impact assessment directive, albeit in a somewhat reduced form. Another example can be found in the REACH regulation. The REACH regulation provides that very hazardous chemicals, which cause considerable risks to human health or the environment, can obtain an authorization only under the condition, that there are no suitable alternative substances or technologies.

d) Flexibility with regard to binding objectives

Another approach to incentivise innovation through regulation is to **focus on the outcomes**. Binding objectives set a target and possibly the criteria to be followed to achieve compliance, instead of prescribing the exact mechanisms by which compliance is obtained.[13] They allow for flexibility and enable companies to develop a suitable and cost-effective way to comply. What is more, setting targets without prescribing the methods, avoids the risk of creating lock-ins. Lock-ins may occur if the regulatory requirements refer to a specific technique to meet a target, leaving no room for other methods.

e) Right to challenge

Similar objectives lie behind the so-called right to challenge. It allows public organisations, local governments and possibly even the Member States to **apply for an exemption from an existing rule or regulation**. To be granted this right, applicants have to show how they would be better able to deliver improved public outcomes.[14] Companies could be granted the right to challenge regulatory requirements, if they can demonstrate that they can surpass a regulatory target, or that they can comply in the same way.

However, one has to consider carefully the areas where a right to challenge can be granted. If a company applies for an exemption from a requirement that prescribes a specific technique, bringing forward the argument that it had developed a completely new technique which yields a much better outcome, the competent authorities will have to examine, whether that new technique will not cause new risks to consumers and the environment. Although the burden of

[13] Pelkmans/Renda, Does EU regulation hinder or stimulate innovation?, 2014, p. 5.
[14] *Independent Expert Group on Public Sector Innovation, Powering European Public Sector Innovation (Report), 2013, pp. 42.* https://ec.europa.eu/research/innovation-union/pdf/psi_eg.pdf

proof is on the applier, it might be demanding for the authority to evaluate the question. Nevertheless, in specific cases a right to challenge may allow companies to derogate from legal requirements. This would increase openness of the legal framework with regard to innovation.

f) Benchmarking and Best Practise

A comparative evaluation of performance, strategies or processes allows for the identification of the best approaches which can then become a benchmark. The legislator can use benchmarking to identify best performances and consider them in legislative decisions. A concrete example for benchmarking is the Top Runner Approach which was developed in Japan and became the inspiration for ecodesign legislation in the EU.[15] It aims at establishing dynamic efficiency standards by adjusting regulation to benchmark products. Products that do not comply with a benchmark efficiency standard after a certain period can no longer be placed on the market. Another tool, which bears some resemblance to benchmarking, is learning from best practice. Best practice examples provide a great potential to disseminate innovation. Learning by best practice requires a systematic comparison between Member States or authorities. Unlike the benchmark approach, which targets identifying the best performer of a particular group, the best practice approach aims at finding positive examples within the examined cases.

g) Innovation Deals

Regulatory uncertainty identified by innovators, can be addressed by means of interpretation of the existing legal framework. **Innovation Deals** are meant to involve the European Commission, the relevant Member State authorities as well as stakeholders **in finding ways to avoid potential barriers to innovation arising from existing EU law or Member State implementation**. Innovation Deals are inspired by the 'Green Deal' Programme of the Government of the Netherlands, where a large number of agreements were pursued and proved successful in supporting the national Green Growth policy by providing regulatory clarity for innovative solutions. Based on this experience and in cases where a regulatory obstacle can only be addressed at EU level, the European Commission could help national, regional or local authorities to identify and make use of the existing flexibility in the EU legislative framework or to implement specific legal provisions appropriately by providing clarification. The latter may concern actions which the EU law already allows for, but where confirmation or clarification of the legal position is sought. Innovation Deals would be restricted to innovative initiatives which struggle with limited access to the market but can lead to a potentially extensive applicability.

h) Sunset clauses

Finally, sunset clauses are a way of reacting to rapidly changing market conditions that the legislator cannot properly anticipate. Sunset clauses can be defined as legal or regulatory provisions that shall be extinguished after a certain period, except if the renewal of the clause is requested.[16] Sunset clauses bear resemblance to experimental legislation, because they enable

[15] Jänicke, Megatrend Umweltinnovation, 2012, p. 47.
[16] Sofia Ranchordás, Constitutional Sunsets and Experimental Legislation, 2014, pp. 52.

the legislator or regulator to "try out" a new regulatory approach. This can be useful in a situation of great uncertainty and lack of information. **When little is known about a situation, a temporary legislative measure can be a better option than no legislative action**. What is more, sunset clauses may ease the decision of the legislator, because the decision is easily extinguished. Sunset clauses extinguish automatically, if the legislator or the regulatory authority does not actively renew them after a fixed period. Lawmakers can use sunset clauses to gather information and experience. For these reasons, sunset clauses can encourage quicker legislative or regulative changes in dynamic fields or under uncertain circumstances. They are therefore an innovation-friendly tool.

i) Innovation Action Plans

A more proactive approach to spur innovation is entailed in the concept of an innovation-oriented action plan. **Action plans aim at implementing policy goals by providing a range of regulatory tools, often combined with funding programmes**. One example is the Eco-Innovation Action Plan launched by the Commission in 2011. The Eco-Innovation Action Plan aims at supporting innovative products, services and technologies which reduce the use of resources. The Commission identified limited market access as a major obstacle to these products and services. The Eco-Innovation Action Plan provides different tools to improve market access, as for example funded demonstration and market replication projects. It also addresses regulatory burdens, respectively aims at setting regulatory incentives. As a result, the concerned authorities, in particular the Commission itself, have to review existing legislation to check for outdated standards or gaps with regard to the promotion of eco-innovative efforts.

V. Conclusion

Regulation has the potential to drive innovation when it is well-designed, flexible and regularly updated to reflect market developments. In order to make sure that the regulatory process becomes more innovation-friendly, the innovation principle could be a guiding principle. This should not amount to a single intervention in support of innovation but ought to be part-and-parcel of the entire regulatory cycle.

The innovation principle will gain acceptance, if it is conceived in a comprehensive manner. It should aim at improving the overall societal well-being by enhancing the effectiveness, coherence and comprehensibility of regulation. However, if the innovation agenda focuses exclusively on competitiveness, that is, on reducing costs to industry, without considering social and environmental costs, it risks yielding *less* regulation instead of better results[17].

In a fair balance with other treaty based principles the innovation principle should be integrated in all of its stages and expressed through a range of instruments. The resulting cultural change will mean that innovation will be better accepted as a sustainable way of addressing Europe's societal challenges and improving its green growth prospects.

[17] Wiener, Better Regulation in Europe, p. 14.